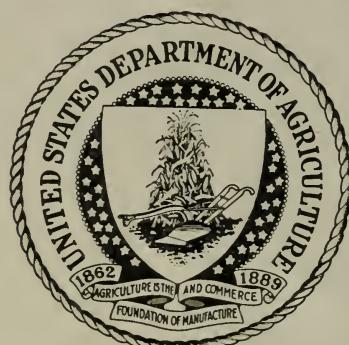


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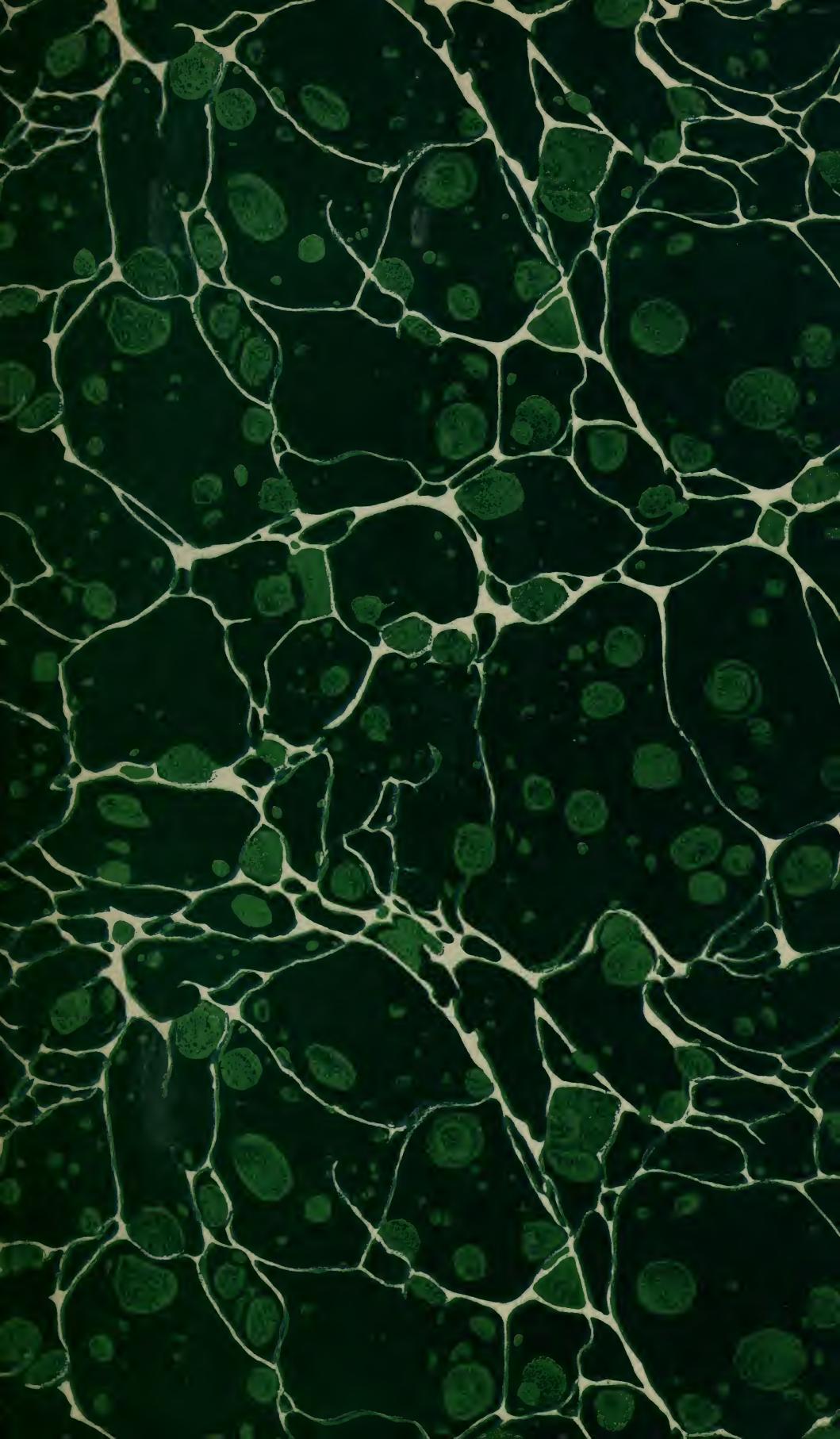
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41
U. S. DEPARTMENT OF AGRICULTURE.

LIBRARY—BULLETIN NO. 41.

JOSEPHINE A. CLARK, LIBRARIAN.

LIST OF REFERENCES TO PUBLICATIONS RELATING TO IRRIGATION AND LAND DRAINAGE.

COMPILED BY
ELLEN A. HEDRICK.

PREPARED UNDER THE DIRECTION OF THE LIBRARIAN.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1902.

PUBLICATIONS OF THE LIBRARY OF THE DEPARTMENT OF AGRICULTURE.

BULLETINS.

- No. 1. Accessions to the Department Library [January-March], 1894.
2. Periodicals and society publications currently received at the Department Library. 1894.
3. Accessions to the Department Library, April-June, 1894.
4. Accessions to the Department Library, July-October, 1894.
5. Accessions to the Department Library, November-December, 1894.
6. Accessions to the Department Library, January-March, 1895.
7. Accessions to the Department Library, April-June, 1895.
8. Accessions to the Department Library, July-September, 1895.
9. List of publications of the U. S. Department of Agriculture from 1841 to June 30, 1895, inclusive. 1896.
10. Accessions to the Department Library, October-December, 1895.
11. Accessions to the Department Library, January-March, 1896.
12. Accessions to the Department Library, April-June, 1896.
13. Accessions to the Department Library, July-September, 1896.
14. Accessions to the Department Library, October-December, 1896.
15. Accessions to the Department Library, January-March, 1897.
16. References to the literature of the sugar beet, exclusive of works in foreign languages; compiled by Claribel R. Barnett. 1897.
17. Accessions to the Department Library, April-June, 1897.
18. Bibliography of poultry; compiled by Emma B. Hawks. 1897.
19. Accessions to the Department Library, July-September, 1897.
20. Reference list of publications relating to edible and poisonous mushrooms; compiled by Josephine A. Clark. 1898.
21. Accessions to the Department Library, October-December, 1897.
22. Accessions to the Department Library, January-March, 1898.
23. Accessions to the Department Library, April-June, 1898.
24. List of publications relating to forestry in the Department Library, 1898.
25. Accessions to the Department Library, July-September, 1898.
26. Accessions to the Department Library, October-December, 1898.
27. Accessions to the Department Library, January-March, 1899.
28. Accessions to the Department Library, April-June, 1899.
29. Accessions to the Department Library, July-September, 1899.
30. Accessions to the Department Library, October-December, 1899.
31. Accessions to the Department Library, January-March, 1900.
32. Accessions to the Department Library, April-June, 1900.
33. Accessions to the Department Library, July-September, 1900.
34. Accessions to the Department Library, October-December, 1900.
35. Accessions to the Department Library, January-March, 1901.
36. Accessions to the Department Library, April-June, 1901.
37. Catalogue of the periodicals and other serial publications (exclusive of U. S. Government publications) in the Library of the U. S. Department of Agriculture; prepared under the direction of Josephine A. Clark, librarian, 1901.
38. Accessions to the Department Library, July-September, 1901.
39. Accessions to the Department Library, October-December, 1901.
40. Accessions to the Department Library, January-March, 1902.
41. List of references to publications relating to irrigation and land drainage; compiled by Ellen A. Hedrick. 1902.
42. Catalogue of the publications relating to botany in the library of the U. S. Department of Agriculture. (In press.)

U. S. DEPARTMENT OF AGRICULTURE.

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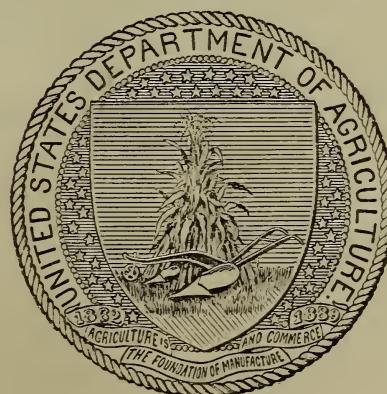
JOSEPHINE A. CLARK, LIBRARIAN.

LIST OF REFERENCES TO PUBLICATIONS
RELATING TO IRRIGATION AND
LAND DRAINAGE.

COMPILED BY

ELLEN A. HEDRICK.

PREPARED UNDER THE DIRECTION OF THE LIBRARIAN.



WASHINGTON:
GOVERNMENT PRINTING OFFICE,
1902.

LETTER OF TRANSMITTAL

U. S. DEPARTMENT OF AGRICULTURE,

Washington, D. C., September 21, 1901.

SIR: I have the honor to transmit herewith and to recommend for publication as a bulletin of the Library of the Department a manuscript entitled "List of references to publications relating to irrigation and land drainage." This list has been prepared, in cooperation with the Office of Experiment Stations, by Miss Ellen A. Hedrick, who was appointed for the special work in connection with the irrigation investigations.

The list includes references to irrigation and land drainage principally, but it has been deemed advisable to include, also, references to a few allied subjects, such as hydraulics, and some departments of engineering. No attempt has been made to catalogue articles in periodicals except in the following cases, namely: Transactions and Proceedings of the American Society of Civil Engineers, Transactions and Proceedings of the Technical Society of the Pacific Coast, Minutes of Proceedings of the Institute of Civil Engineers, Journal and Proceedings of the Royal Society of New South Wales, and *Annales des Ponts et Chaussées: Mémoires et documents*.

The work has been done in the libraries of Washington containing the largest collection of books on the subjects mentioned. Books which are available for reference in these libraries are indicated by abbreviations after the entries.

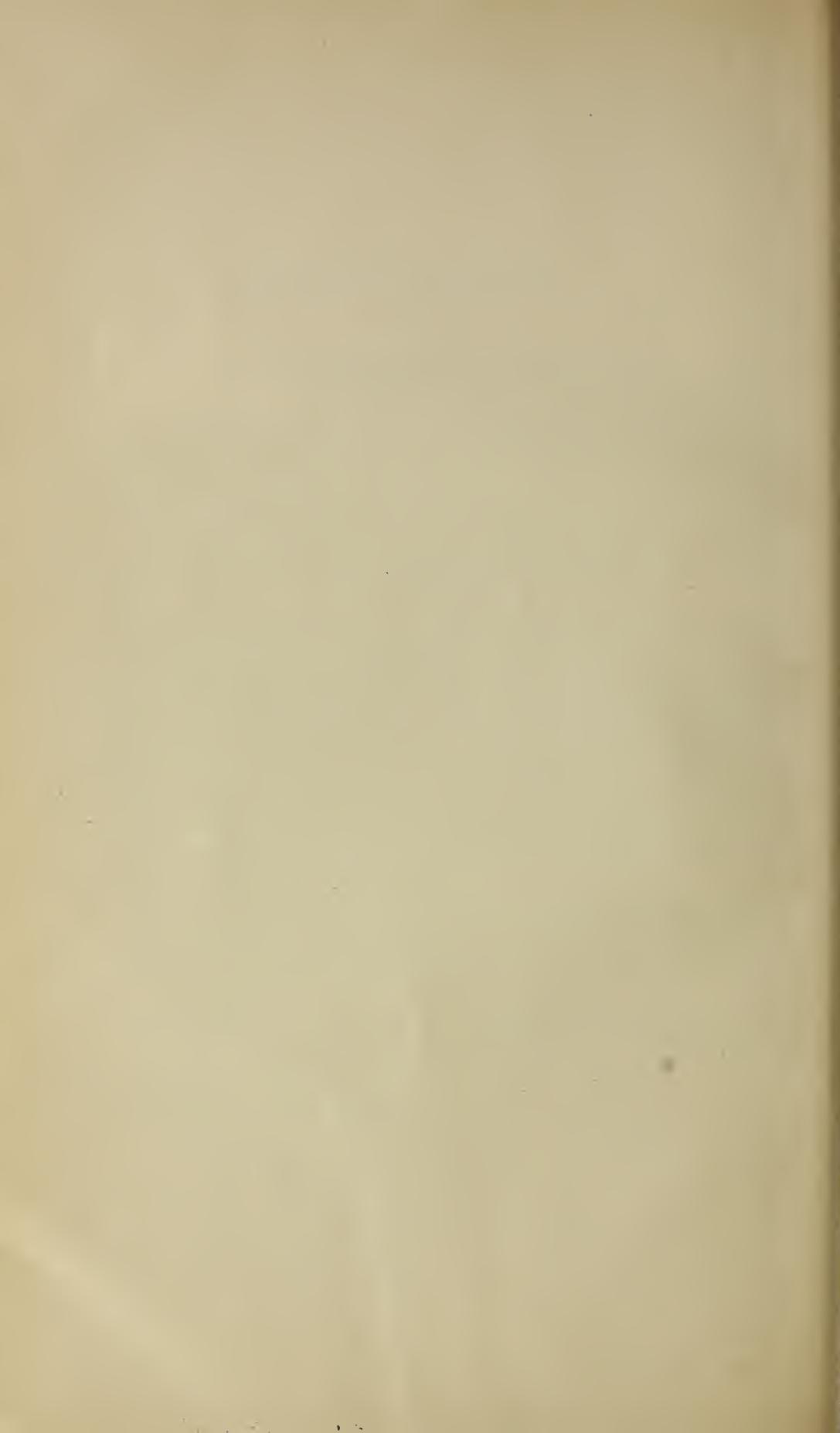
Respectfully,

JOSEPHINE A. CLARK,
Librarian.

Hon. JAMES WILSON,
Secretary of Agriculture.

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LIST OF REFERENCES TO PUBLICATIONS RELATING TO IRRIGATION AND LAND DRAINAGE.

ABBREVIATIONS.—W^A=Library of the Department of Agriculture. W^G=Library of the Geological Survey. W^P=Library of the Patent Office. W^C=Library of Congress. References marked * could not be verified.

- 1 Abbot, Henry Larcom. Practical gauging of rivers. (*In Professional papers on Indian engineering.* 7:183-188. 1870.)
Remarks addressed to the *Essayon* club of the Corps of United States engineers.
— *See also*, as joint author, **Humphreys, A. A.**
- 2 Abbott, T. K. Wells in Liverpool plains [New South Wales]. (*In Roy. soc. N. S. W. Jour. and proc.*, 1880. 14:281-292. map. 1881.)
— — —; [reprint]. (*In N. S. W.—Roy. comm. conservation of water.* First report. Appendix K 1. pp. 44-47. 1885.) W^A
- 3 Abbott, W. E. Water supply in the interior of New South Wales. (*In Roy. soc. N. S. W. Jour. and proc.*, 1884. 18:85-111. map. 1885.)
- 4 Abel, Gustav, and Vincent, Otto. Die drainage, deren theorie und praxis. Ed. 6, rev. pp. 235. pl. 8°. Leipz., Baumgärtner's buchhandlung, 1882. W^G
Vom *Mecklenburger patriotischen verein* gekrönte preisschrift.
Preface of 1st edition is dated 1853.
- 5 Ablett, W. H. *See*, as editor, **Roland, Arthur.**
- 6 Acheson, Frederick. Essay on the collection and storage of water in Victoria. pp. 47. map. 8°. Melbourne, Govt., 1861. W^C
Victorian Government prize essay.
- 7 Adams, Arthur L. Stave pipe, its economic design and the economy of its use. (*In Amer. soc. civ. eng. Proc.* 24:676-708. il. 1898; with discussion, *Trans.* 41:27-84. il. 1899.)
- 8 Adler, Georg Christian. *See*, as editor, **Frontinus, Sextus Julius.**
- 9 Akers, W. R. *See*, as state engineer, **Nebraska—Irrigation, State board of.**
- 10 Albuquerque, N. Mex. *See*, for irrigation congress held here in 1895, **National irrigation congress, Official report.**
- 11 Aleksandrovich, K. G. *See*, as engineer, **Russia—Public works ministry.**

7 Alexander, B. S., Mendell, G. H., and Davidson, George. Report upon desert lands of Kern county. (*In Haggan, J. B. Desert lands of Kern county, Cal.* pp. 300-306. 1877.)

8 *Alfonso-Spagna, F. Studii sulla economia della acque. pp. 176. Palermo, 1864.

9 Allen, Parker Roseoe. Periyar tunnel. (*In Inst. civ. eng. Min. of proc.* 128:164-172. il. 1897.)
Discussion and correspondence on this paper and the paper on Diversion of the Periyar, by John Pennywick, are given, 128:173-205.

10 *Amenduni, Giovanni. Sulle opere di bonificazione, della plaga litorea dell' Agro Romano. Text & plates [2 v.]. Roma, 1884.

11 American society of civil engineers. Proceedings . . . v. 1-26. 8°. N. Y., 1876-1900. W^A W^G W^P W^C
Papers are first issued in the **Proceedings** and are afterwards reissued in the **Transactions**, with discussions. Papers were not issued in the **Proceedings** previous to volume 23. Such papers as relate to irrigation are entered in the list under their respective authors.

12 — Report of committee on the cause of failure of the South Fork dam. (*In Amer. soc. civ. eng. Trans.* 24:431-469. pl. maps. 1891.)
Paging given includes discussion on the subject.
Committee consisted of James B. Francis, W. E. Worthen, M. J. Becker, and A. Fteley.

— — : [abstract]. (*In Inst. civ. eng. Min. of proc.* 106: 364-366. 1891.)

13 — Transactions. v. 1-44. 8°. N. Y., 1872-1900. W^A W^G W^P W^C
See note under **American society of civil engineers**, **Proceedings**.

14 American society of irrigation engineers. Annual for 1892-93. v. [1]. 8°. Denver, 1893. W^A
Continued under the title **Transactions**.

15 — Cession of the public lands, etc.; resolutions adopted by society and paper relative to cession of public lands to the States, forestry, irrigation, etc. pp. 37. il. 8°. [Wash., Govt., 1897.] (**U. S.—Senate.** 55th Cong., 1st sess. S. doc. 130. *In v. 5.*) W^A
Includes paper by Elwood Mead on Arid public lands, their reclamation, management, and disposal.

16 — Constitution and by-laws adopted by the Annual convention, Dec. 28, 1892. pp. 30. 16°. Denver, 1893. W^G
With list of members.

17 — Transactions, Jan., 1895-Jan., 1897. v. 2, no. 1-3. 8°. Denver, 1895-97. W^A
v. 2, no. 1-2, title reads **Quarterly**.
For v. 1, see **American society of irrigation engineers**, **Annual**.

18 *Anderegg, J. Der rationelle wiesenbau in gebirgsgegenden. Stuttg., 1879.

19 *Anderson, J. Practical treatise on draining bogs and swampy ground. 8°. Lond., 1797.

20 Anderson, J. C. Financial results of Madras canals. (*In Professional papers on Indian engineering.* 3:392-401. 1866.) Memorandum from the report of the Ganges canal committee.

21 — Irrigation in the Madras Presidency: report. (*In Professional papers on Indian engineering.* 6:361-385. map. 1869.)

22 **Anderson, R. C.** Tables for facilitating the calculation of every detail in connection with earthen and masonry dams. pp. 406. pl. 8°. Lond., H. S. King, 1876. W^P
Contains as appendix, Report on the design and construction of masonry dams, by W. J. Macquorn Rankine.

23 **Anderson, William.** Notes of a journey through the northeast portion of the delta of the Nile in April, 1884. (*In Instit. civ. eng. Min. of proc. 76:346-354. 1884.*)

24 **Andrade Corvo, J. de.** Mémoire sur les rizières du Portugal. (*In Ann. des ponts et chaussées: mém. et doc., 1862, semest. 2. pp. 217-247.*)

25 **Andreossy, Antoine François.** Histoire du Canal du Midi, ou Canal de Languedoc, considéré sous les rapports d'invention, d'art, d'administration, d'irrigation, et dans ses relations avec les étangs de l'intérieur des terres qui l'avoisinent. New ed. Text & plates 2 v. sq. 4°. Paris, 1804. W^C

26 **Annales des ponts et chaussées; mémoires et documents relatifs à l'art des constructions et au service de l'ingénieur, 1831-1900.** ser. 1, v. 1-ser. 7, v. 28. 8°. Paris, Librairie des corps nationaux des ponts et chaussées, des mines et des télégraphes, n. d. W^G W^C W^P
Each series covers a period of ten years and contains twenty volumes, except the seventh which has twenty-eight volumes.
Such papers as relate to irrigation are entered in the list under their respective authors.

27 **Apulian aqueduct: [abstract].** (*In Instit. civ. eng. Min. of proc. 143:373. 1901.*)
Original paper in *Giornale del genio civile*, May, 1900.. p. 205.

28 **Argentine Republic.—Public works ministry.** Report to the Director-General of Public works on the present state of the San Roque water-dam; by Frederico Stavelius; [abstract]. (*In Instit. civ. eng. Min. of proc. 112:419-421. 1893.*)
Original paper in *Annales de la Sociedad científico argentina*, Buenos Ayres. il. Sept., 1892.

29 **Arizona agricultural experiment station.** Agricultural development in southwestern Arizona, pumping water for irrigation; [by F. A. Gulley and C. B. Collingwood]. pp. 15-24. 8°. Tucson, 1893. (Bulletin 11.) W^A

30 — Irrigation in Arizona; [by V. E. Stolbrand]. pp. 14. 8°. Tucson, 1891. (Bulletin 3.) W^A

31 **Arnaud, Alessandro.** Sui serbatoi artificiali di acqua a benefizio dell' irrigazione. pp. 31. 8°. Saluzzo, Rovera e Compagno, 1893. W^A
Estratto dal *Bollettino del Comizio agrario di Saluzzo*, 1893.

Artesian and underflow investigation and irrigation inquiry. See **United States—Agriculture, Department of—Artesian and underflow investigation and irrigation inquiry.**

32 ***Ascono, Antonio.** Manuale teorico-pratico sull' uso delle acque per la derivazione e la condotta di esse e per le irrigazione de campi, etc. pp. 176. pl. 8°. Milan, Silvestri, 1836.

33 **Ashurst, Francis Henry.** Reconstruction of the Bhim Tal dam, Kumaon, N. W. P., India. (*In Instit. civ. eng. Min. of proc. 75:202-210. 1884.*)

34 Association of American agricultural colleges and experiment stations. Proceedings of 13th annual convention, July 5-7, 1899; edited by A. C. True, W. H. Beal, and H. H. Goodell. pp. 112. 8°. Wash., Govt., 1900. (U. S.—Agriculture, Dept. of—Experiment Stations, Office of. Bulletin 76.) WA
At the meeting of the section on agriculture and chemistry, alkali and irrigation in the West were subjects of discussion. R. H. Loughridge, B. C. Buffum, F. W. Traphagen, L. G. Carpenter, A. C. True, Elwood Mead, E. J. Wickson, and A. J. McClellan made short addresses.

35 Aubuisson de Voisins, Jean François d'. Treatise on hydraulics for the use of engineers; translated from the French and adapted to the English units of measure, by Joseph Bennett. pp. 532. pl. 8°. Boston, Little, Brown & co., 1852. WP

36 Auchincloss, W. S. Waters within the earth and laws of rainfall. pp. 43. il. 8°. Phila., W. S. Auchincloss, 1897. WG

Aughey, Samuel. See, as commissioner, United States—Agriculture, Department of, Artesian wells upon the Great plains; report of geological commission.

37 Aymard; Maurice. Étude sur les irrigations de la Métidja et les cours d'eau de l'Atlas. (In Ann. des ponts et chaussées: mém. et doc., 1853. semest. 2. pp. 46-131. pl.)

38 — Irrigation works of Alicanti, in Spain; [abstract]. (In Institut. civ. eng. Min. of proc. 45:309. 1876.)
Original paper in Annales du Génie civil. 2d ser. 4:638, 688.

39 — Irrigations du midi de l'Espagne, études sur les grands travaux hydrauliques et le régime administratif des arrosages de cette contrée; par Aymard, précédé d'un rapport de M. Lebasteur. Text & atlas [2 v.]. 8° & f°. Paris, Eugène Lacroix, 1864. (Publications scientifiques, industrielles et agricoles de E. Lacroix.) WG

40 — Mémoire sur la pratique des arrosages en Algérie. (In Ann. des ponts et chaussées: mém. et doc., 1870, [semest. 1]. pp. 236-300.)

41 Babb, Cyrus C. Hydrography of the Potomac basin. (In Amer. soc. civ. eng. Trans. 27:21-38. chart. 1891.)

42 — Rainfall and river-flow. (In Amer. soc. civ. eng. Trans. 28:323-347. pl. 1893.)
Paging given includes discussion on the paper.

43 Bachmann. Arched masonry dams; [abstract]. In Institut. civ. eng. Min. of proc. (138:504. 1899.)
Original paper in Centralblatt der Bauverwaltung, 1899. p. 10.

44 Bailey, Gilbert E. [Artesian waters and geology of the southwest section of the state of South Dakota, and eastern section of Wyoming.] (In U. S.—Agriculture, Dept. of—Artesian and underflow investigation and irrigation inquiry. Preliminary investigation, etc. pp. 65-70. 1890.)

Bain, Thomas. See Cape of Good Hope—Lands, mines, and agriculture, Department of. Report of geological and irrigation surveyor. 1892—Report on Calitzdorp irrigation scheme.

45 Baker, Benjamin. River Nile. (In Institut. civ. eng. Min. of proc. 60:367-379. 1880.)

46 **Baker**, Ira O. Treatise on masonry construction. Ed. 2. pp. 552. il. pl. 8°. N. Y., Wiley & sons, 1890. W^G

47 **Baker**, M. N., *editor*. Manual of American water-works, compiled from special returns, containing the history, details of construction, mode of water supply, cost, etc., of every water-works in the United States and Canada. pp. 611. 8°. N. Y., Engineering news, 1889. W^G

— — — 4th issue. pp. 611. 8°. N. Y., Engineering news, 1897. W^A

48 **Barbet**, —. Note sur le calcul des barrages de réservoirs en maçonnerie. (*In Ann. des ponts et chaussées: mém. et doc.*, 1898, trimest. 2. pp. 265-299.)

49 — — — Note sur les conditions de résistance des barrages de réservoirs en maçonnerie. (*In Ann. des ponts et chaussées: mém. et doc.*, 1899, trimest. 1. pp. 22-56.)

50 **Barbour**, Erwin Hinckley. Wells and windmills in Nebraska. pp. 85. il. pl. 8°. Wash., Govt., 1899. (*U. S.—Interior, Dept. of the—Geological survey—Hydrography, Division of. Water supply and irrigation papers.* 29.) W^A

— — — (*U. S.—House of Representatives.* 55th Cong. 3d sess. H. doc. 299. *In v. 73.*) W^A

51 **Barilari**, —. Survey of the course of the Po; [abstract]. (*In Instit. civ. eng.* Min. of proc. 49: 330-333. 1877.) Original paper in *Giornale de genio civile.* 14:611.

52 **Barker**, F. C. Irrigation in Mesilla valley, New Mexico. pp. 51. il. pl. map. 8°. Wash., Govt., 1898. (*U. S.—Interior, Dept. of the—Geological survey—Hydrography, Division of. Water supply and irrigation papers.* 10.) W^A

— — — (*U. S.—House of Representatives.* 55th Cong. 2d sess. H. doc. 301. *In v. 60.*) W^A

53 **Barois**, Julien Hippolyte Eugène. Irrigation dans les Indes. (*In Ann. des ponts et chaussées: mém. et doc.*, 1891, semest. 2. pp. 261-311.)

54 — — L'irrigation en Égypte. Text & plates [2 v.]. 4°. [Paris, Imprimerie nationale, 1887.] (*France—Agriculture, Ministère de l'—Hydraulique agricole, Direction de l'.* Bulletin. fasc. H.) W^G

— — — Paris, Imprimerie nationale, 1887.

— — English. Irrigation in Egypt; translated by A. M. Miller. pp. 113. pl. maps. 4°. Wash., Govt., 1889. (*U. S.—House of Representatives.* 50th Cong. 2d sess. H. mis. doc. 134.) W^A W^G

55 **Barr**, William M. Pumping machinery; a practical hand-book relating to the construction and management of steam and power pumping machines. pp. 447. il. pl. 8°. Phila., J. B. Lippincott co., 1893. W^P W^C

56 **Barraclough**, S. H., and **Strickland**, T. P. Experimental investigation of the flow of water in uniform channels. (*In Roy. Soc. N. S. W. Jour. and proc.*, 1897. 31:356-376. 1897.)

57 Barral, Jean Augustin. Agriculture, les prairies et les irrigations de la Haute-Vienne: rapports. pp. 771. pl. 4^o. Paris, Imprimerie nationale, 1884. (France—Agriculture, Ministère de l’—Agriculture, Direction de l’.) W^G W^A

58 * — Drainage des terres arables. Ed. 3. 2 v. il. pl. Paris, Librairie agricole de la maison rustique, 187—.

59 — Irrigations dans le département de Vaucluse; rapport sur le concours ouvert en 1876 pour le meilleur emploi des eaux d’irrigation. pp. 595. pl. 7. map. f^o. Paris, Imprimerie nationale, 1877. (France—Agriculture et du commerce, Ministère de l’—Agriculture, Direction de l’.) W^G

60 — — —; rapport sur le concours ouvert en 1877 pour le meilleur emploi des eaux d’irrigation. pp. 582. il. pl. 6. f^o. Paris, Imprimerie nationale, 1878. (France—Agriculture et du commerce, Ministère de l’—Agriculture, Direction de l’.) W^A W^G

61 — Irrigations dans le département des Bouches-du-Rhône; rapport sur le concours ouvert en 1875 pour le meilleur emploi des eaux d’irrigation. pp. 548. il. pl. 4. f^o. Paris, Imprimerie nationale, 1876. (France—Agriculture et du commerce, Ministère de l’—Agriculture, Direction de l’.) W^A W^G
Analyses, chemical and botanical, of different kinds of hay grown in this district are given in chap. 30, pp. 463-486.

62 — — —; rapport sur le concours ouvert en 1876 pour le meilleur emploi des eaux d’irrigation. pp. 271. pl. f^o. Paris, Imprimerie nationale, 1876. (France—Agriculture et du commerce, Ministère de l’—Agriculture, Direction de l’.) W^A W^G
Analyses of different kinds of hay are continued in chap. 24, pp. 224-257.

63 * — Législation du drainage, des irrigations et autres améliorations foncières permanentes. pp. 664. il. pl. Paris, Librairie agricole de la maison rustique, 1862.

Barrett, W. W. *See*, as superintendent, North Dakota—Irrigation and forestry, Department of.

64 * Baudot, J. G. Des réservoirs du Nil. pp. 15. Vichy, Bougarel, 1894.

65 Baumgarten, —. Notice sur le moulinet de Woltmann, destiné à mesurer les vitesses de l’eau, sur son perfectionnement et sur les expériences faites avec cet instrument. (In Ann. des ponts et chaussées: mém. et doc., 1847, semest. 2. pp. 326-374. pl.)

66 — — — Notice sur les rivières de la Lombardie et principalement sur le Pô. (In Ann. des ponts et chaussées: mém. et doc., 1847, semest. 1. pp. 129-199. pl.)
Analyse des différents mémoires de M. Lombardini.

67 — Rapport à M. le ministre des travaux publics sur plusieurs travaux de colmatage, de desséchement et d’irrigation, exécutés en Italie. (In Ann. des ponts et chaussées: mém. et doc., 1853, semest. 1. pp. 289-318. pl.; 1854, semest. 2. pp. 217-232.)

68 Bazaine. Étude sur l’influence des irrigations sur l’altitude d’une nappe souterraine, avec application aux irrigations pratiquées à Gennevilliers. (In Ann. des ponts et chaussées: mém. et doc., 1883, semest. 1. pp. 34-60. pl.)

69 **Bazin, H.** Étude comparative des formules nouvellement proposées pour calculer le débit des canaux découverts. (*In Ann. des ponts et chaussées: mém. et doc.*, 1871, [semest. 1.] pp. 9-43. pl.)

70 — Étude d'une nouvelle formule pour calculer le débit des canaux découverts. (*In Ann. des ponts et chaussées: mém. et doc.*, 1897, trimest. 4. pp. 20-70. pl.)

* — — pp. 55. pl. Paris, 1898.

71 — Expériences nouvelles sur l'écoulement en déversoir. (*In Ann. des ponts et chaussées: mém. et doc.*, 1888, semest. 2. pp. 393-448. pl.; 1890, semest. 1. pp. 9-65. pl.; 1891, semest. 2. pp. 445-520. pl.; 1894, semest. 1. pp. 249-357. pl.; 1896, semest. 2. pp. 645-731. pl.; 1898, trimest. 2. pp. 151-264. pl.)

Abstracts of 1st, 2d, and 4th articles entitled *New experiments on the flow of water over weirs* are given in *Instit. civ. eng. Min. of proc.* 96:372-374. 1889; 101:322-324. 1890; 117:421-423. 1894.

* — *English.* Recent experiments on the flow of water over weirs. article 1; translated by Arthur Marichal and John C. Trautwine, jr. pp. 52. pl. [Phila. ? 1890?]

* — —, article 6; translated by G. T. Nelles. [pp. 33.] n. p. 1899.

72 — Experiments upon the contraction of the liquid vein issuing from an orifice and upon the distribution of the velocities within it; translated by John C. Trautwine, jr. Ed. 1. pp. 64. pl. 8°. N. Y., J. Wiley & sons, 1896. WP

Translated from *Mémoires présentés par divers savants à l'Académie des sciences de l'Institut de France*, v. 32.

73 — Notice sur les travaux d'agrandissement du réservoir de Panthier, canal de Bourgogne. (*In Ann. des ponts et chaussées: mém. et doc.*, 1880, semest. 2. pp. 241-260. pl.)

— —: [abstract]. (*In Instit. civ. eng. Min. of proc.* 64: 365-367. 1881.)

— *See also*, as joint author, **Darcy, Henri Philibert Gaspard**.

75 **Beach, Horace.** [Finding of artesian waters in the Dakotas.] (*In U. S.—Agriculture, Dept. of—Artesian and underflow investigation and irrigation inquiry. Preliminary investigation, etc.* pp. 141-144. 1890.)

— *See also*, as commissioner, **United States—Agriculture, Department of**, Artesian wells upon the Great plains; report of geological commission.

76 **Beardmore, Nathaniel.** Manual of hydrology. pp. 384. pl. 18. 8°. Lond., Waterlow and sons, 1862. WP

CONTENTS—1. Hydraulic and other tables.—2. Rivers, flow of water, springs, wells, and percolation.—3. Tides, estuaries, and tidal rivers.—4. Rainfall and evaporation.

77 * **Beck, Otto.** Land- und volkswirtschaftliche tagesfragen über ent- und bewässerungsanlagen. Trier, 1866-1868.

78 * **Becker, Max.** Der wasserbau in seinem ganzen umfange; ein leitfaden zu vorlesungen und zum selbstunterrichte für wasser- und strassenbau-ingenieure und andere techniker. Text & plates [2 v.]. 8° & f°. Stuttg., 1856.

* **Becker, Max**—Continued.

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1168 **Pomeroy, John Norton.** Treatise on the law of water rights as the same is formulated and applied in the Pacific states, including the doctrine of appropriation and the statutes and decisions relating to irrigation, revised and enlarged edition of "Pomeroy on riparian rights," with several additional chapters; by Henry C. Black. pp. 592. 8°. St. Paul, West pub. co., 1893. **WA**

1169 * **Poncelet, Jean Victor, and Lesbros, Joseph Aimé.** Expériences hydrauliques sur les lois de l'écoulement de l'eau à travers les orifices rectangulaires verticaux à grandes dimensions, entreprises à Metz. 4°. Paris, 1832. (Mémoires présentés par divers savants à l'Académie des sciences de l'Institut national de France.)
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1170 **Ponmareda, F. A.** Desagüe del valle de México: nuevo sistema de impedir las inundaciones de la ciudad y del valle de México y hacer desaparecer en parte las causas de insalubridad que ofrecen uno y otro. pp. 167. 16°. México, 1860. **WC**
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1171 **Ponzi, Giuseppe.** Tevere ed il suo delta: memoria. pp. 47. maps. 8°. [Roma, 1876.] **WC**
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1172 **Poole, William.** Rapid preliminary surveys on the Darling river, N. S. W. (*In Instit. civ. eng.* Min. of proc. 139:259-264. pl. 1900.)

1173 **Pope, J. B.** Measurement of water for irrigation. pp. 25. il. 8°. N. Y., [J. B. Pope, 1896].

1174 **Porter, Dwight.** Water-power streams of Maine. (*In U. S.—Interior, Dept. of the—Geological survey—Hydrography, Division of.* Report of progress of stream measurements, 1897. pp. 34–111. il. maps. 1899.)

1175 **Porter, W. M., and Duncan, C. M.** Excavation and embankment tables for preliminary estimates. pp. [23]. 4°. Denver, Porter & Duncan, 1896. W^c

1176 **Possenti, Carlo.** Sulla sistemazione idraulica della Valdichiana; osservazioni storico-critiche. pp. 89. 8°. Firenze, 1866. W^c

1177 **Poston, Charles D.** Irrigation. pp. 30. pl. 8°. Chicago, 1887.

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1178 * **Pözl, J. von.** Die bayerischen wassergesetze vom 28. Mai 1852. Ed. 2. Erlangen, 1880.

1179 **Prendergast, H. L.** Streeviguntum anicut. (*In Professional papers on Indian engineering.* 7:3–22. pl. 1870.) Includes note by J. C. A., chief engineer.

1180 **Prince, G. T.** Logarithmic diagram for flow of water in pipes; [abstract]. (*In Institut. civ. eng.* Min. of proc. 139:418. 1900.) Original paper in *Engineering news*, July 6, 1899. p. 4.

1181 **Professional papers on Indian engineering;** edited by J. G. Medley. v. 1–7. il. pl. 8°. Roorkee, Thomason college, [1863]–70. W^c
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1183 — Nouvelle architecture hydraulique; contenant l'art d'élever l'eau au moyen de différentes machines, de construire dans ce fluide, de le diriger et généralement de l'appliquer, de diverses manières, aux besoins de la société. 2 v. pl. 4°. Paris, Firmin Didot, 1790, 1796. W^c W^p
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1184 **Provis, W. A.** Experiments on the flow of water through small pipes. (*In Institut. civ. eng.* Trans. 2:201–210. 1838.)

1185 **Pueblo gravity water company of Colorado.** Report of [Jas. D. Schuyler] consulting engineer. pp. 16. map. 8°. Denver, Shattuck print. co., 1890. W^a

1186 **Punjab—Public works department—Irrigation branch.** Note on the revised estimates for the Sirhind canal; by H. W. Gulliver, chief engineer of irrigation. v. p. f°. [Lahore, Govt., 1881.] W^c

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1187 — — — Report and revised estimate for the Sirhind canal, 1880. v. p. f°. Lahore, Govt., 1880. W^G

1188 — — — Report on the Sidhnai canal project, 1883. v. p. f°. n. p., [Govt.], 1883. W^G

1189 — — — Revenue report of the Irrigation department, Punjab, 1892/93-98/99. maps. pl. f°. Simla, Lahore, Govt., 1893-1900. W^G

1190 — — — Rules for rajbaha estimates, [or canal distributary]: by J. H. Western, supdg. eng. Sirhind canal. pp. [6]. [Lahore, Govt., 1885?]

1191 — — — Sidhnai canal atlas; plans. sq. f°. Lahore, 1889. W^G

1192 — — — Sidhnai canal project, including the Koranga, Fazal Shah, and Abdul Hakim canals. pp. 56. f°. Lahore, [Govt.,] 1888. W^G

1193 — — — Western Jumna canal atlas; plans. sq. f°. Lahore, 1890. W^G

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1195 Purcell, Gervaise. Use of asphalt in irrigation works in California. (*In Instit. civ. eng. Min. of proc.* 110:286-288. 1892.)

1196 Puvis, A. *Irrigation des prés des Vosges*. Paris, 1846.

1197 Queensland—*Geological survey*. Artesian water in the western interior of Queensland; by Robert L. Jack. pp. 16. 8°. Brisbane, Govt., 1895.
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1198 — — — Delimitation of the artesian water area north of Hughenden; report by A. Gibb Maitland, assistant geologist, and note by the government geologist. pp. 19. map. f°. [Brisbane, Govt.,] 1898. (Geological survey publications. no. 121.)

1199 — [Public lands and agriculture, Department of.] Irrigation and conservation of water; reports by A. Rigby, irrigation engineer. pp. 26. pl. maps. f°. [Brisbane, Govt., 1890.] W^G
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1200 — — — Irrigation of the Johnstone, Herbert, Mackay, and Oxley districts; [reports by A. Rigby, irrigation engineer]. pp. 12. pl. maps. f°. [Brisbane,] Govt., 1890. (Queensland—*Legislative assembly*.) W^G
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1202 — — — Report of the hydraulic engineer [J. B. Henderson] on water supply, 1883-1900. f°. [Brisbane, 1883-1900.] W^A W^G

1203 Rafter, George W. Genesee river storage surveys; report to C. W. Adams, state engineer. pp. 176. pl. 86. maps. 8°. Albany, State, 1897. (N. Y.—*State engineer and surveyor.*)

1204 — High masonry dams in Europe; report to C. W. Adams, state engineer. pp. 19. pl. 40. 8°. Albany, State, 1897. (N. Y.—*State engineer and surveyor.*)

1205 — On the flow of water over dams. (*In Amer. soc. civ. eng. Proc.* 26: 226-319. il. pl. 1900; with discussion, *Trans.* 44: 220-398. il. pl. chart. 1900.)
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1206 — Report on the water supply of the western division of the Erie canal to C. W. Adams, state engineer and surveyor. pp. 52. maps. 8°. Albany, State, 1897. (N. Y.—*State engineer and surveyor.*)

1207 — Sewage irrigation. 2 pt. pp. 200. il. pl. 8°. Wash., Govt., 1897, 1899. (U. S.—*Interior, Dept. of the—Geological survey—Hydrography, Division of.* Water-supply and irrigation papers. 3, 22.) W^A
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1210 — Water resources of the state of New York. 2 pt. pp. 200. il. pl. maps. 8°. Wash., Govt., 1899. (U. S.—*Interior, Dept. of the—Geological survey—Hydrography, Division of.* Water-supply and irrigation papers. 24, 25.) W^A
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1214 Rane, F. William. Sub-irrigation in the greenhouse. pp. 255-270. 8°. Charleston, State, 1893. (W. Va. agric. exper. sta. Bulletin 33.) W^A

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1223 **Rhind**, Robert Hunter. Coefficients of discharge applicable to certain submerged weirs of large dimensions. (In **Instit. civ. eng.** Minn. of proc. 85:307-326. 1886.)
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1229 Rippel, W. Capacity of storage reservoirs for water supply. (*In Institut. civ. eng.* Min. of proc. 71: 270-278. 1883.)

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1399 Ulrich, J. C. Irrigation in the Rocky mountain states. pp. 64. pl. map. 8°. Wash., Govt., 1899. (**U. S.—Agriculture, Dept. of—Experiment stations, Office of.** Bulletin 73.)
Umatilla irrigation company. *See United States—House of Representatives—Indian affairs, Committee on.*

1400 Underhill, F. S. [Wells and waters of North Dakota.] (*In U. S.—Agriculture, Dept. of—Artesian and underflow investigation and irrigation inquiry.* Preliminary investigation, etc. pp. 105-109. 1890.)

1401 United States—*Agriculture, Department of.* Artesian wells upon the Great plains; report of a geological commission appointed to examine a portion of the Great plains of the Rocky mountains, and report upon localities most favorable for experimental borings. pp. 38. map. 8°. Wash., Govt., 1882.
W^A W^G
Commissioners—C. A. White, Samuel Aughey, and Horace Beach.
Also bound in *United States—Department of Agriculture, Special reports*, v. 5.

1402 — — Climate, soil characteristics, and irrigation methods of California; by C. W. Irish. (*In Yearbook*, 1895. pp. 475-486. il. pl. 1896.)
— — —; [separate]. 8°.

United States—*Agriculture, Department of*—Continued.

1403 — — — [Facts and conditions surrounded and connected with the question of irrigation within the United States; letter from the Department to the president of the Royal commission on water supply.] (*In Victoria—Roy. comm. water supply*. First progress report. pp. 79–88. 1885.)

1404 — — — Irrigation for garden and greenhouse; by L. R. Taft. (*In Yearbook, 1895*. pp. 233–246. il. 1896.) W^A
— — —; [separate]. 8°. W^A
— — —; [separate, with] Galloway, B. T. Health of plants in greenhouses. pp. 232–256. il. 8°. Wash., Govt., 1896. W^A

1405 — — — Irrigation in the United States, [its extent and methods with digest of laws governing water supply]; report prepared by R. J. Hinton. pp. 240. maps. 8°. Wash., Govt., 1887. W^G

— — — (U. S.—Senate. 49th Cong. 2d sess. S. mis. doc. 15. *In v. 1*.) W^A W^G
Contains extended extracts from *Irrigation in western America*, by Alfred Deakin, entitled *Australian report on American irrigation*, pp. 197–222; also, information as to water supply and irrigation in Mexico furnished by the Mexican government, pp. 223–231. A second edition of this work, revised and enlarged, appears in *United States—Senate—Irrigation and reclamation of arid lands, Select committee on*, Report.

1406 — — — Irrigation, its evils, the remedies, and the compensations; by George P. Marsh. (*In [Annual] report, 1874*. pp. 362–381. 1875.) W^A
— — — pp. 22. 8°. [Wash., Govt., 1874.] (U. S.—Senate. 43d Cong. 1st. sess. S. mis. doc. 55. *In v. 1*.) W^A

1407 — — — Practical irrigation; by C. T. Johnson and J. D. Stanard. (*In Yearbook, 1900*. pp. 491–512. il. 1901.) W^A
— — —; [separate]. 8°.

1408 — — — Report on climatic and agricultural features . . . and needs of arid regions of Pacific slope, with notes on Arizona and New Mexico; by E. W. Hilgard, T. C. Jones, and R. W. Furnas, [commissioners]. pp. 182. 8°. Wash., Govt., 1882. W^A
CONTENTS—Climates of Pacific slope; by E. W. Hilgard.—Field crops and animal industries of Pacific coast; by T. C. Jones.—Miscellaneous field cultures; by E. W. Hilgard.—Standard sugar refinery, Alvarado, Cal.; by R. W. Furnas.—California wines and brandies; by E. W. Hilgard.—Raisin-making; by R. W. Furnas.—Orchard and small fruits.—Olive industry.—English walnuts.—Fruit canning.—Exotic fruits and useful plants; by E. W. Hilgard.—Insect pests.—Phylloxera in California; by E. W. Hilgard.—Quarantine rules.—Arizona and New Mexico; by R. W. Furnas.
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1409 — — — Rise and future of irrigation in the United States; by Elwood Mead. (*In Yearbook, 1899*. pp. 591–612. pl. 1900.)

1410 — — — *Artesian and underflow investigation and irrigation inquiry*. Preliminary investigation to determine proper location of artesian wells within the area of the 97th meridian and east of the foot-hills of the Rocky mountains; [prepared by Richard J. Hinton, special agent in charge]. pp. 398. il. pl.

United States—Agriculture, Department of—Artesian and underflow investigation and irrigation inquiry—Continued.

maps. 8°. Wash., Govt., 1890. (U. S.—Senate. 51st Cong. 1st sess. S. ex. doc. 222. In v. 12.) W^A

CONTENTS—Reports by R. J. Hinton, special agent in charge, E. S. Nettleton, supervising engineer, and Robert Hay, general field geologist; reports of the field geologists and field agents, G. E. Culver, G. E. Bailey, L. E. Hicks, P. H. Van Diest, E. T. Dumble, F. S. Underhill, S. G. Updike, F. F. B. Coffin, Horace Beach, J. W. Gregory, L. G. Carpenter, F. E. Roesler; tabulation of wells reported.

— — — — —; synopsis. pp. 7. 8°. [Wash., Govt., 1890.] (U. S.—Senate. 51st Cong. 1st sess. S. mis. doc. 179. In v. 4.) W^A

Synopsis was made in advance of the report for the use of the U. S. Senate Committee on irrigation.

1411 — — — — — Report of [R. J. Hinton] special agent in charge, 1890, 1891. (In U. S.—Agriculture, Dept. of. Report, 1890. pp. 471—488. map. 1890; same, 1891. pp. 439—450. map. 1892.) W^A

Each report also issued separately.

For later reports of Office of irrigation inquiry, see United States—Agriculture, Department of—Irrigation inquiry, Office of.

1412 — — — — — Report on progress of irrigation investigation under deficiency appropriation act of 1890. pp. 337. pl. map. 8°. [Wash., Govt., 1891.] (U. S.—Senate. 51st Cong. 2d sess. S. ex. doc. 53. [pt. 1.] In v. 1.) W^A

— — — — —; [with title-page and title] Progress report on irrigation in the United States; prepared by R. J. Hinton. pt. 1. W^A W^G

CONTENTS—Irrigation in United States, progress report for 1890; by R. J. Hinton.—Progress report of artesian and underflow investigation; by Robert Hay.—Progress report of central division of the Great plains; by J. W. Gregory.—Progress of irrigation in the northwest; by Joseph W. Nimmo.—Irrigation statistics and progress in Colorado for 1890; by L. G. Carpenter.—Report on artesian water in Nevada; by Charles W. Irish.—Phreatic waters in Nye county, Nevada; by George Nichols.—Inhibition of rocks; by Robert T. Hill.—Cultivation of raisin grape by irrigation [in] California districts; condensed from treatise by Gustav Eisen.—Irrigation in Australia; by R. J. Hinton.—Notes of irrigation conference held at Melbourne, Victoria.—Notes on experience of other countries in administration of their water supply; by H. G. McKinney.—Irrigation theories and practices; translated from *Notions élémentaires théoriques et pratiques sur les irrigations appliquées aux terres en culture . . . par J. Charpentier de Cossigny*, adapted in part from report on water supply, Victoria, Australia; by Alfred Deakin.—Irrigation in France, Italy, and Spain.—Tillage and products of soil on irrigated lands; adapted from paper (1887) by Stephen Cureton.—Arizona as presented in Census bulletin, no. 35.—Alkali soils and waters in California; extracts from reports (1888—89); by E. W. Hilgard.—Appendix; copies of circulars and general letters sent out by Office of irrigation inquiry.

1413 — — — — — Report of progress of irrigation in November and December. pp. 14. il. maps. charts. 8°. [Wash., Govt., 1891.] (U. S.—Senate. 51st Cong. 2d sess. S. ex. doc. 53. pt. 2. In v. 1.) W^A

— — — — —; [with title-page and title] Progress report of artesian and underflow investigation between 97th degree of west longitude and the foothills of the Rocky mountains; prepared by E. S. Nettleton. pt. 2. W^A

1414 — — — — — [Final report.] 4 pts. pl. maps. 8°. Wash., Govt., 1892. (U. S.—Senate. 52d Cong. 1st sess. S. ex. doc. 41. 4 pts. In v. 4.) W^A W^G

pt. 1, with title-page and title, Report on irrigation and cultivation of the soil thereby, with physical data, conditions, and progress within the United States for 1891; by R. J. Hinton, special agent in charge.

Accompanying reports—Preliminary report on possibilities of reclamation of arid regions of Kansas and Colorado by utilizing underlying waters. by Howard Miller.—Methods of applying water to land as practiced in central portions of California, by C. E. Grunsky.—Cultivation of soil by means of irrigation in some of the southern states.—Agricultural hydraulics; translated from the French of J. Charpentier de Cossigny.—Irrigation by artesian wells in Algiers.—Facts and conditions relating to irrigation in various countries; prepared by R. J. Hinton.—Extract from, extent and importance of ancient water supply and irrigation works, by F. S. Gipps.—Waterworks, east of arid region, having their supply from artesian and underflow sources, abstracts from Manual of American waterworks, 1889—90.

United States—Agriculture, Department of—Artesian and underflow investigation and irrigation inquiry—Continued.

pt. 2, with title-page and title. Final report of the chief engineer. Edwin S. Nettleton. Accompanying reports.—Underground water surveys; Red river valley artesian basin; and Miles City, Montana, artesian basin; by W. W. Follett.—Report on geological character of certain sections of the state of Montana, showing possibility of imbibition of water which would be available for artesian purposes; by O. C. Mortson.—Tabulation of artesian wells data; by B. S. La Grange.

pt. 3, with title page and title. Final geological reports of artesian and underflow investigation between 97th meridian of longitude and the foothills of the Rocky mountains, made by Robert Hay, chief geologist.

Accompanying reports.—Occurrence of artesian and other underground waters . . . : by R. T. Hill.—Underflow and sheet waters, irrigable lands, and geological structure of Nebraska, with its effect upon water supply; by L. E. Hicks.—South Dakota; by G. E. Culver.

pt. 4, with title-page and title. Final report on the mid-plains division, by J. W. Gregory, special agent; and, Special report on certain artesian conditions in the state of South Dakota, by F. F. B. Coffin, engineer for South Dakota.

1415 — — — *Experiment stations, Office of.* Abstract of laws for acquiring titles to water from Missouri river and its tributaries, with legal forms in use; compiled by Elwood Mead. pp. 77. 8°. Wash., Govt., 1899. (Bulletin 60.) W^A
Contains water laws of Colorado, Kansas, Montana, Nebraska, South Dakota, Wyoming, and Northwest Territories of Canada.

1416 — — — Duty of water; general instructions to observers. pp. 4. il. 4°. [Wash., Govt., 1899.] (Irrigation investigation schedule 2.) W^A

1417 — — — Duty of water in Gallatin valley; by Samuel Fortier. pp. 175-196. il. pl. map. 8°. [Wash., Govt., 1901.] W^A
From bulletin 86, Use of water in irrigation; report.

— — — (In U. S.—Agriculture, Dept. of—*Experiment stations, Office of.* Duty of water in Nebraska. pp. 175-196. il. pl. map. 1901.)

1418 — — — Duty of water in Nebraska, by O. V. P. Stout; Duty of water under Amity canal, by Thomas Berry; Duty of water in Wyoming, by C. T. Johnson; Duty of water in Gallatin valley, by Samuel Fortier; Duty of water on Big Cottonwood creek, Utah, by R. C. Gemmell; Duty of water under Logan and Richmond canal, by George L. Swendsen; Duty of water as related to irrigation problems of Boise valley, Idaho, by D. W. Ross. pp. 149-248. il. pl. maps. 8°. [Wash., Govt., 1901.] W^A
From bulletin 86, Use of water in irrigation; report.

1419 — — — Irrigation in field and garden; by E. J. Wickson. pp. 40. il. 8°. Wash., Govt., 1901. (U. S.—Agriculture, Dept. of. Farmers' bulletin 138.) W^A

1420 — — — Irrigation in fruit growing; by E. J. Wickson. pp. 48. il. 8°. Wash., Govt., 1900. (Farmers' bulletin 116.) W^A

1421 — — — Irrigation in Hawaii; by Walter Maxwell. pp. 48. il. pl. 8°. Wash., Govt., 1900. (Bulletin 90.) W^A

1422 — — — Irrigation in humid climates; by F. H. King. pp. 27. il. 8°. Wash., Govt., 1896. (Farmer's bulletin 46.) W^A

1423 — — — Irrigation in New Jersey; by Edward B. Voorhees. pp. 40. il. 8°. Wash., Govt., 1900. (Bulletin 87.) W^A

United States—Agriculture, Department of—Experiment stations, Office of—Continued.

1424 ————— Irrigation in Rocky mountain states: by J. C. Ulrich. pp. 64. pl. map. 8°. Wash., Govt., 1899. (Bulletin 73.) W^A

1425 ————— Irrigation investigations. (In U. S.—Agriculture, Dept. of. Farmers' bulletin 97. pp. 27-29. 1899.) W^A

1426 ————— Irrigation investigations in California under the direction of Elwood Mead, assisted by William E. Smythe, Marsden Manson, J. M. Wilson, Charles D. Marx, Frank Soulé, C. E. Grunsky, Edward M. Boggs, and James D. Schuyler; [preliminary report of cooperative irrigation investigations in California of Office of experiment stations and California water and forest association]. pp. 73. 8°. Wash., Govt., 1901. (U. S.—Senate. 56th Cong. 2d sess. S. doc. 108. In v. 5.) W^A

Summary report of the investigations of the department in California transmitted to Congress in response to Senate resolution of Jan., 1901. For full report see *United States—Agriculture, Department of—Experiment stations, Office of. Report of irrigation investigations in California.*

1427 ————— Irrigation laws of the Northwest Territories of Canada and of Wyoming, with discussions by J. S. Dennis, Fred Bond, and J. M. Wilson. pp. 90. pl. maps. 8°. Wash., Govt., 1901. (Bulletin 96.) W^A

CONTENTS—Water rights under Canadian northwest irrigation act; by J. S. Dennis.—Irrigation system of Wyoming; by Fred Bond and J. M. Wilson.

1428 ————— List of publications of the Office of experiment stations on irrigation. pp. 2. 8°. [Wash., Govt., 1900]. W^A

————— [Ed. 2] rev. pp. 4. 8°. [Wash., Govt., 1901.] W^A

1429 ————— Notes on irrigation in Connecticut and New Jersey: by C. S. Phelps and Edward Voorhees. pp. 64. il. 8°. Wash., Govt., 1897. (Bulletin 36.)

CONTENTS—Irrigation in Connecticut; by Phelps.—Irrigation in New Jersey; by Voorhees.

1430 ————— Proceedings of 13th annual convention of Association of American agricultural colleges and experiment stations, July 5-7, 1899; edited by A. C. True, W. H. Beal, and H. H. Goodell. pp. 112. 8°. Wash., Govt., 1900. (Bulletin 76.) W^A

At the meeting of section on agriculture and chemistry, alkali and irrigation in the West were subjects of discussion. R. H. Loughridge, B. C. Buffum, F. W. Traphagen, L. G. Carpenter, A. C. True, Elwood Mead, E. J. Wickson, and A. J. McClatchie made short addresses.

1431 ————— Recent progress in the study of irrigation. (In U. S.—Agriculture, Dept. of. Farmers' bulletin 56. pp. 17-20. il. 1897.) W^A

1432 ————— Report of irrigation investigations in California under the direction of Elwood Mead, assisted by William E. Smythe, Marsden Manson, J. M. Wilson, Charles D. Marx, Frank Soulé, C. E. Grunsky, Edward M. Boggs, and James D. Schuyler. pp. 411. il. pl. maps. f°. Wash., Govt., 1901. W^A

Investigations were conducted by the *Office of experiment stations* in cooperation with the *California water and forest association*. A preliminary report giving a general summary of this report was transmitted to Congress and is numbered in the Congressional set 56th Cong. 2d sess., S. doc. 108.

United States—Agriculture, Department of—Experiment stations, Office of—Continued.

CONTENTS—Agricultural situation in California; by Elwood **Mead**.—Irrigation problems of Honey lake basin, Cal.; by W. E. **Smythe**.—Features and water rights of Yuba river, Cal., by Marsden **Marson**.—Irrigation investigations on Cache creek; by J. M. **Wilson**.—Report on irrigation problems in Salinas valley; by C. D. **Marx**.—Irrigation from San Joaquin river; by Frank **Soulé**.—Water appropriations from Kings river; by C. E. **Grunsky**.—Study of water rights on Los Angeles river, Cal.; by E. M. **Boogs**.—Problems of water storage on torrential streams of southern California as typified by Sweetwater and San Jacinto rivers; by J. D. **Schuyler**.—Recommendations of special agents and experts.

1433 — Reservoir system of Cache la Poudre valley; by E. S. **Nettleton**. pp. 48. pl. map. 8°. Wash., Govt., 1901. (Bulletin 92.) W^A

1434 — Statement of Elwood Mead [before Committee on irrigation of arid lands]. (In U. S.—*House of Representatives—Irrigation of arid lands, Committee on. Hearings*. pp. 88–108. 1901.)

1435 — Statement of Elwood Mead [before Committee on public lands]. (In U. S.—*House of Representatives. Public lands, Committee on. Hearings*. pp. 124–130. 1901.)

1436 — Subwatering greenhouse plants. (In U. S.—*Agriculture, Dept. of. Farmers' bulletin* 78. pp. 21–24. 1898.) W^A

1437 — Use of water for irrigation in Texas; Use of water in irrigation in Pecos Valley, by W. M. Reed, Use of water in irrigation in Arizona, by W. H. Code; Duty of water under Gage canal, Riverside, Cal., by W. Irving. pp. 83–148. pl. maps. 8°. [Wash., Govt., 1901.] W^A
From bulletin 86, Use of water in irrigation; report.

1438 — Use of water in irrigation; Discussion of investigations, by Elwood Mead; Computation of discharge records and preparation of diagrams, by C. T. Johnson. pp. 15–82. il. pl. 8°. [Wash., Govt., 1901.] W^A
From bulletin 86, Use of water in irrigation; report.

1439 — Use of water in irrigation in Wyoming and its relation to ownership and distribution of natural supply; by B. C. Buffum. pp. 56. pl. charts. 8°. Wash., Govt., 1900. (Bulletin 81.) W^A

1440 — Use of water in irrigation, report of investigations made in 1899 under supervision of Elwood Mead and C. T. Johnson; including reports by W. M. Reed [and others]. pp. 253. il. pl. maps. 8°. Wash., Govt., 1900. (Bulletin 86.) W^A
(U. S.—*House of Representatives*. 56th Cong. 2d sess. H. doc. 466. In v. 43.) W^A

CONTENTS—Discussion of investigations, by Elwood **Mead**.—Computation of discharge records and preparation of diagram, by C. T. **Johnson**.—Texas—Use of water in irrigation in Pecos valley, N. Mex., by W. M. **Reed**.—Use of water in irrigation in Arizona; by W. H. **Code**.—Duty of water under Gage canal, Riverside, Cal., by W. **Irving**.—Duty of water in Nebraska; by O. V. P. **Stout**.—Duty of water under Amity canal, Colo., by Thomas **Berry**.—Duty of water in Wyoming; by C. T. **Johnson**.—Duty of water in Gallatin valley, Mont., by Samuel **Fortier**.—Duty of water on Big Cottonwood creek, Utah, by R. C. **Gemmell**.—Duty of water under Logan and Richmond canal, Utah; by G. L. **Swendsen**.—Duty of water, irrigation problems of Boise valley, Idaho; by D. W. **Ross**.

1441 — Usefulness of reservoirs to agriculture in irrigated regions; report [by Elwood Mead]. pp. 14. il. 8°. [Wash., Govt., 1899.] (U. S.—*Senate*. 55th Cong. 3d sess. S. doc. 124. In v. 11.) W^A

United States—Agriculture, Department of—Experiment stations, Office of—Continued.

1442 ——— Water-right problems of Bear river; by Clarence T. Johnson and Joseph A. Breckons. pp. 40. pl. map. 8°. Wash., Govt., 1899. (Bulletin 70.) **W^A**
 CONTENTS—Water supply of Bear river and its diversion; by J. C. Johnson.—Interstate water rights in Bear river; by J. A. Breckons.

1443 ——— Water rights on Missouri river and its tributaries, by Elwood Mead; with papers on water laws of Colorado, by John E. Field, and of Nebraska, by J. M. Wilson. pp. 80. il. maps. Wash., Govt., 1899. (Bulletin 58.) **W^A**

1444 ——— *Forestry, Division of.* Statement of Gifford Pinchot [on forest preservation as related to conservation of water supply; before Committee on irrigation of arid lands]. (In U. S.—House of Representatives—*Irrigation of arid lands, Committee on.* Hearings. pp. 72–74. 1901.)

1445 ——— Statement of Gifford Pinchot [on forest preservation as related to conservation of water supply before Committee on public lands]. (In U. S.—House of Representatives—*Public lands, Committee on.* Hearings. pp. 65–73. map. pl. 1901.) "

1446 ——— *Irrigation inquiry, Office of.* Abstract of the laws of the several states and territories on irrigation and water rights; compiled by O. A. Critchett. pp. 180. 8°. Wash., Govt., 1893. (Bulletin 1.) **W^A**

1447 ——— Report of [C. W. Irish], special agent in charge, 1893–1895. 3d-[5th]. (In U. S.—*Agriculture, Dept. of.* Report, 1893. pp. 593, 594. 1894; same, [1894]. pp. 219–220. 1895; same, [1895]. pp. 183–185. 1895.) **W^A**
 Office was discontinued June 30, 1896.
 For earlier reports of this office, see *United States—Agriculture, Department of—Artesian and underflow investigation and irrigation inquiry.*

1448 ——— *Soils, Division of.* Alkali lands; by Milton Whitney and Thomas H. Means. pp. 23. il. 8°. Wash., Govt., 1899. (Farmers' bulletin 88.) **W^A**

1449 ——— Alkali soils of Yellowstone valley from preliminary investigation of soils near Billings, Mont.; by Milton Whitney and T. H. Means. pp. 39. il. pl. 8°. Wash., Govt., 1898. (Bulletin 14.) **W^A**

1450 ——— *Weather bureau.* Daily river stages at river-gauge stations on the principal rivers of the United States. v. 1–6. 4°. Wash., Govt., 1890–1900. **W^A**
 CONTENTS—v. 1. *Stages of the Ohio river and of its principal tributaries, 1858 to 1889; compiled by Thomas Russell.—v. 2. *Stages of the Mississippi river and of its principal tributaries, except the Ohio river, 1860 to 1889; compiled by Thomas Russell.—v. 3. *Stages of water at miscellaneous river stations in California, Oregon, North Carolina, etc., 1875 to 1889; compiled by Thomas Russell.—v. 4. Daily river stages at river-gauge stations on the principal rivers of the United States for the years 1890, 1891, and 1892; by Thomas Russell.—v. 5. Same, for the years 1893, 1894, and 1895; by Park Morrill.—v. 6. Same, for the years 1896, 1897, 1898, and 1899; by H. C. Frankenfield.
 v. 1 of this series was published by the Signal service.

1451 ——— *Commission on the irrigation of the San Joaquin, Tulare, and Sacramento valleys, California.* Report. pp. 91. maps. 8°. [Wash., Govt., 1874.] (U. S.—House of Representatives, 43d Cong. 1st sess. H. ex. doc. 290. In v. 17.) **W^A W^G**
 COMMISSIONERS—B. S. Alexander, George H. Mendell, George Davidson.
 Chapter 4 gives the history, description, and statistics of irrigation in India, Italy, and France.

United States—Continued.

1452 — *House of Representatives—Agriculture, Committee on.* Arid lands of New Mexico; report to accompany H. R. 8058. pp. 3. 8°. [Wash., Govt., 1889.] (50th Cong. 2d sess. H. rp. 3934. *In v. 2.*) W^G W^A
Irrigation of the Jornada del Muerte. Report favors passage of bill with amendments.

1453 — — — Water-ditch in Utah; [adverse] report. 1 p. 8°. [Wash., Govt., 1878.] (45th Cong. 2d sess. H. rp. 224. *In v. 1.*) W^A
Report in reply to petition of citizens of Sevier county, Utah, asking aid of government in improving their lands.

1454 — — — *Foreign affairs, Committee on.* Equitable distribution of the waters of the Rio Grande; report to accompany H. res. 246. 1 p. 8°. [Wash., Govt., 1898.] (55th Cong. 2d sess. H. rp. 598. *In v. 3.*) W^A
Requests transmission of proceedings of International commission on equitable distribution of waters of Rio Grande river for which see *United States—State, Department of*, Equitable distribution of the waters of the Rio Grande.

1455 — — — *Indian affairs, Committee on.* Hudson reservoir and canal company; report to accompany H. R. 9029. pp. 3. 8°. [Wash., Govt., 1896.] (54th Cong. 1st sess. H. rp. 2049. *In v. 8.*) W^A
Report amending House bill 9029, to grant company right of way through Gila river reservation.

1456 — — — Right of way through Yakima Indian reservation: report to accompany H. R. 2015. p. 1. 8°. [Wash., Govt., 1894.] (53d Cong. 2d sess. H. rp. 714. *In v. 2.*) W^A
Passage of bill to grant right of way through Yakima reservation to Columbia irrigation company recommended, with amendments.

1457 — — — Right of way through Yakima Indian reservation: report to accompany H. R. 6854. p. 1. 8°. [Wash., Govt., 1894.] (53d Cong. 2d sess. H. rp. 1402. *In v. 4.*) W^A
Passage of bill recommended to grant right of way through Yakima reservation to Tacoma and Yakima land company for irrigation purposes.

1458 — — — Umatilla irrigation company; report to accompany H. R. 1969. 1 p. 8°. [Wash., Govt., 1894.] (53d Cong. 2d sess. H. rp. 355. *In v. 1.*) W^A
Report favoring bill to extend time for construction of ditch across Umatilla reservation.

1459 — — — *Irrigation of arid lands, Committee on.* Arid lands in the United States belonging to the government; report. pp. 4. 8°. [Wash., Govt., 1894.] (53d Cong. 2d sess. H. rp. 1152. *In v. 4.*) W^A
Report submitting House bill 7558 as substitute for House bill 7154.

1460 — — — Artesian wells in state of Colorado; report to accompany H. R. 6448. p. 1. 8°. [Wash., Govt., 1896.] (54th Cong. 1st sess. H. rp. 1996. *In v. 8.*) W^A
Favors appropriation of \$100,000 for artesian wells in eastern portion of Colorado.

1461 — — — Hearings before the committee relating to the reclamation of the arid lands of the United States, Jan., 1901. pp. 130. 8°. Wash., Govt., 1901. W^A
Contains statements of F. G. Newlands, F. H. Newell, G. H. Maxwell, N. H. Darton, F. W. Mondell, Gifford Pinehot, J. F. Wilson, Elwood Mead.

United States—House of Representatives—Irrigation of arid lands, Committee on—Continued.

1462 ————— Reclamation of arid lands; report to accompany H. R. 14241. 6 pts. 8°. [Wash., Govt., 1901.] (56th Cong. 2d sess. H. rp. 2927. 6 pts. *In v. 3.*) W^A
 CONTENTS—pt. 1. Report recommending bill; Views of R. D. Sutherland. pp. 9.—pt. 2. Views of the minority. pp. 10.—pt. 3. Views of T. H. Tongue. pp. 4.—pt. 4. Views of committee recommending substitute bill. pp. 12.—pt. 5. Report to accompany amendment to H. R. 14241. p. 1.—pt. 6. Views of W. H. King. pp. 2.

1463 ————— Reclamation of certain desert lands; report [amending] H. R. 13977. pp. 2. 8°. [Wash., Govt., 1901.] (56th Cong. 2d sess. H. rp. 2904. *In v. 3.*) W^A

1464 ————— Reservoir near San Carlos, Ariz.; report to accompany H. R. 3733. [to provide water for irrigation of Sacaton Indian reservation and other purposes]. pp. 2. 8°. [Wash., Govt., 1901.] (56th Cong. 2d sess. H. rp. 2934. *In v. 3.*) W^A

1465 ————— To aid in the reclamation of the arid lands; report to accompany H. R. 6710. pp. 2. 8°. [Wash., Govt., 1896.] (54th Cong. 1st sess. H. rp. 1437. *In v. 6.*) W^A
 Amends act making appropriations for sundry civil expenses, 1895.

1466 ————— Topographic surveys, etc., of arid lands; report to accompany H. R. 6246. pp. 6. 8°. [Wash., Govt., 1896.] (54th Cong. 1st sess. H. rp. 424. *In v. 2.*) W^A

1467 ————— *Irrigation of arid lands, Select committee on.* Arid lands of the United States; report to accompany H. R. 6790. pp. 12. 8°. [Wash., Govt., 1892.] (52d Cong. 1st sess. H. rp. 569. *In v. 2.*) W^A
 Bill favors ceding arid lands to the several states and territories wherein they are situate.
 Report includes views of the minority in protest against the bill.

1468 ————— Ceding arid lands to states and territories; report to accompany H. R. 12210. pp. 202. map. 8°. [Wash., Govt., 1891.] (51st Cong. 2d sess. H. rp. 3767. *In v. 4.*) W^A
 Contains extracts from report of L. M. Holt to California state board of irrigation; statements of J. W. Powell, Anson Mills, J. W. Gregory, C. E. Dutton, and E. S. Nettleton before the committee.

1469 ————— Irrigation of arid lands; international boundary; Mexican relations; report to accompany H. R. 3924. pp. 9. 8°. [Wash., Govt., 1890.] (51st Cong. 1st sess. H. rp. 490. *In v. 2.*) W^A

1470 ————— *Public lands, Committee on.* Arid and desert lands in Colorado; report to accompany H. R. 3857. 2 pts. pp. 3+4. 8°. [Wash., Govt., 1882.] (47th Cong. 1st sess. H. rp. 197. 2 pts.) W^A
 Bill proposes leasing of arid lands. Report presents the bill for consideration without recommendation. pt. 2 is report of the minority against the bill.

1471 ————— Colorado desert; report to accompany H. R. 417. pp. 26. 8°. [Wash., Govt., 1862.] (37th Cong. 2d sess. H. rp. 87. *In v. 4.*) W^A
 Report in reply to the legislature of the state of California asking the United States to cede to said state tract of land known as "Colorado desert." Correspondence on the subject is subjoined to report.

—————; [extracts]. (*In U. S.—House of Representatives—Public lands, Committee on.* Fresh water on Fort Yuma desert. pp. 3-9. 1878.)

United States—House of Representatives—Public lands, Committee on—Continued.

— — — —; [extracts quoted]. (*In U. S.—House of Representatives—Public lands, Committee on.* Fresh water on Colorado desert. pp. 3-8. 1886.)

1472 — — — Fresh water on Colorado desert; report to accompany H. R. 3219. pp. 10. 8°. [Wash., Govt., 1886.] (49th Cong. 1st sess. H. rp. 1321. *In v. 5.*) W^A
Committee adopt report, *United States—House of Representatives—Public lands, Committee on*, Fresh water on Fort Yuma desert; 45th Cong. 2d sess. H. rp. 380. *In v. 2.*

1473 — — — Fresh water on Fort Yuma desert; report to accompany H. R. 3834. pp. 10. 8°. [Wash., Govt., 1878.] (45th Cong. 2d sess. H. rp. 380. *In v. 2.*) W^A
Contains extracts of the report and correspondence from *United States—House of Representatives—Public lands, Committee on*, Colorado desert.

— — — —; [quoted entire]. (*In U. S.—House of Representatives—Public lands, Committee on.* Fresh water on Colorado desert. pp. 1-10. 1886.)

1474 — — — Hearings relating to reclamation and disposal of arid public lands of the west. Jan., 1901. pp. 135. il. pl. maps. 8°. Wash., Govt., 1901.
Contains statements of F. G. Newlands, Chas. D. Walcott, F. H. Newell, Gifford Pinchot, E. A. Hitchcock, R. D. Sutherland, N. H. Darton, G. H. Maxwell, J. C. Bell, and Elwood Mead.

1475 — — — National works in aid of irrigation; report to accompany H. R. 14280. pp. 9. 8°. Wash., Govt., 1901. (56th Cong. 2d sess. H. rp. 2954. *In v. 3.*) W^A

1476 — — — Reclamation of arid lands; report [amending] H. R. 9994. pp. 3. [Wash., Govt., 1898.] (55th Cong. 2d sess. H. rp. 1161. *In v. 4.*) W^A

1477 — — — Report to accompany H. R. 1984 [to provide for occupation of reservoir sites reserved by Geological survey]. pp. 2. 8°. [Wash., Govt., 1896.] (54th Cong. 1st sess. H. rp. 211. *In v. 1.*) W^A

1478 — — — Right of way through certain parks, etc.; report [favoring] H. R. 11973. pp. 2. 8°. [Wash., Govt., 1900.] (56th Cong. 1st sess. H. rp. 1850. *In v. 7.*) W^A

1479 — — — Right of way through parks, reservations, and other public lands; report [amending] H. R. 10225. pp. 2. 8°. [Wash., Govt., 1900.] (56th Cong. 1st sess. H. rp. 993. *In v. 4.*) W^A

1480 — — — Right of way through public lands for tram-roads, [canals, and reservoirs so as to include water for domestic, public, and other purposes]; report [favoring] H. R. 1595. pp. 2. 8°. [Wash., Govt., 1898.] (55th Cong. 2d sess. H. rp. 279. *In v. 2.*) W^A
Senate report on this bill is 55th Cong. 2d sess. S. rp. 600. *In v. 2.*

1481 — — — Right of way through public lands for tram-roads, [canals, reservoirs], etc.; report to accompany H. R. 9607. pp. 3. 8°. [Wash., Govt., 1897.] (54th Cong. 2d sess. H. rp. 2790. *In v. 3.*) W^A

1482 — — — Right of way through public lands; report to accompany H. R. 7828. 1 p. 8°. [Wash., Govt., 1894.] (53d Cong. 2d sess. H. rp. 1320. *In v. 4.*) W^A

United States—*House of Representatives*—Public lands, Committee on—Continued.

1483 — — — Sugar Loaf reservoir; report to accompany S. 2232. pp. 2. 8°. [Wash., Govt., 1896.] (54th Cong. 1st sess. H. rp. 2003. *In v. 8.*) W^A
Report favoring Senate bill 2232, to vacate Sugar Loaf reservoir site, Colorado, and restore lands to entry.

1484 — — — Territories, Committee on. Artesian wells for New Mexico and Arizona; report to accompany H. R. 7937. pp. 2. 8°. [Wash., Govt., 1888.] (50th Cong. 1st sess. H. rp. 793. *In v. 3.*) W^A

1485 — — — Interior, Department of the. Digest of the decisions of the supreme courts of the states and territories of the arid region and of the United States circuit and supreme courts in cases involving questions relative to use and control of water in that region; compiled by D. W. Campbell; revised and edited by W. C. Pollock. pp. 59. 8°. Wash., Govt., 1889. W^A W^G
This list has been further revised and enlarged by Hinton, Richard J., in his Irrigation in the United States. Ed. 2. pp. 329-358. 1890.

1486 — — — Irrigation of certain parts of Montezuma valley, lying within boundaries of Southern Ute Indian reservation. pp. 5. 8°. [Wash., Govt., 1898.] (U. S.—Senate. 55th Cong. 2d sess. S. doc. 124. *In v. 10.*) W^A
Letter from Secretary relative to the purchase of water rights from Montezuma valley canal company.

1487 — — — Report relative to the construction of certain dams in the Rio Grande. pp. 62. pl. 6. maps. 8°. [Wash., Govt., 1889.] (U. S.—Senate. 50th Cong. 2d sess. S. ex. doc. 144. *In v. 4.*) W^A
Contains correspondence and documents in relation to action of Mexican authorities in constructing at Paso del Norte certain wing-dams, and complaints caused thereby.

1488 — — — Statement on irrigation submitted [to Committee on public lands]. (*In U. S.—House of Representatives—Public lands, Committee on.* Hearings. pp. 74-76. pl. 1901.)

1489 — — — Supply of water for Southern Ute Indian reservation; report of J. G. Wright, U. S. Indian inspector, on Montezuma valley canal and its capacity for irrigating. pp. 6. map. 8°. [Wash., Govt., 1897.] (U. S.—*House of Representatives*. 55th Cong. 2d sess. H. doc. 152. *In v. 39.*) W^A

1490 — — — *Census, 1890.* Agriculture, irrigation in Arizona; by F. H. Newell. pp. 8. 8°. Wash., Govt., 1891. (Bulletin 35.)

— — — — —; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 22-32.)

1491 — — — Agriculture, irrigation in Idaho; by F. H. Newell. pp. 26. 8°. Wash., Govt., 1892. (Bulletin 157.)

— — — — —; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 136-156. pl. map.)

1492 — — — Agriculture, irrigation in Montana; by F. H. Newell. pp. 32. 8°. Wash., Govt., 1891. (Bulletin 153.)

— — — — —; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 157-176. il. pl. map.)

United States—Interior, *Department of the—Census, 1890—Continued.*

1493 —— Agriculture, irrigation in Nevada; by F. H. Newell. pp. 24. 8°. Wash., Govt., 1892. (Bulletin 163.)
—— —— —— ——; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 177-192. il.)

1494 —— Agriculture, irrigation in New Mexico; by F. H. Newell. pp. 14. 8°. Wash., Govt., 1891. (Bulletin 60.)
—— —— —— ——; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 193-201.)

1495 —— Agriculture, irrigation in Oregon; by F. H. Newell. pp. 26. 8°. Wash., Govt., 1892. (Bulletin 178.)
—— —— —— ——; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 202-217. il.)

1496 —— Agriculture, irrigation in Utah; by F. H. Newell. pp. 23. 8°. Wash., Govt., 1891. (Bulletin 85.)
—— —— —— ——; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 218-235. il. pl. map.)

1497 —— Agriculture, irrigation in Washington; by F. H. Newell. pp. 17. 8°. Wash., Govt., 1892. (Bulletin 198.)
—— —— —— ——; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 236-247.)

1498 —— Agriculture, irrigation [in western United States]; by F. H. Newell. pp. 22. maps. 4°. Wash., Govt., 1892. (Extra bulletin 23.)

1499 —— Agriculture, irrigation in Wyoming; by F. H. Newell. pp. 15. 8°. Wash., Govt., 1891. (Bulletin 107.)
—— —— —— ——; [revised and greatly enlarged]. (*In his Report on agriculture by irrigation.* pp. 248-256. map.)

1500 —— Report on agriculture by irrigation in western part of United States at 11th census, 1890; by F. H. Newell, special agent. pp. 283. il. pl. maps. 4°. Wash., Govt., 1894. W^A
Bound with reports on agriculture, irrigation, and fisheries.
—— —— —— ——; [separate]. 1894.
—— —— —— —— (*In U. S.—House of Representatives.* 52d Cong. 1st sess. H. mis. doc. 340, pt. 20. *In v. 50*, pt. 10. 1896.) W^A
—— —— —— —— [Ed. 2.] pp. 336. il. pl. maps.
Wash., Govt., 1894 [1896].
Contains an appendix entitled Data concerning water supply, that brings the record up to date of publication.

1501 —— *Geological and geographical survey of the territories.*
Report on arable and pasture lands of Colorado; by Henry Gannett. *In 10th Annual report.* 1876. pp. 311-347. 1878. W^A

United States—Interior, Department of the—Continued.

1502 —— *Geological survey.* American irrigation engineering; by H. M. Wilson. (*In* 13th Annual report, 1891-92. pt. 3. pp. 101-349. il. pl. 1893.) W^A
 Contains list of books on irrigation.

— — — —; [separate]. 4°.

1503 —— Arid lands; statement before Committee on irrigation of the House of Representatives. (*In* U. S.—Interior, Dept. of the—*Geological survey.* 11th Annual report, 1889-90. pt. 2. pp. 203-289. 1891.) W^A

1504 —— Artesian well prospects in the Atlantic coastal plain region; by N. H. Darton. pp. 232. il. pl. maps. 8°. Wash., Govt., 1896. (Bulletin 138.)

— — — — (*U. S.—House of Representatives.* 54th Cong. 2d sess. H. doc. 28. *In* v. 35.) W^A

1505 —— [Construction of reservoirs; letter in regard to bill S. 5833 and report.] (*In* U. S.—Senate—*Public lands, Committee on.* Construction of reservoirs, etc.; report amending S. 5833. pp. 5-7. 1901.)

1506 —— Dictionary of altitudes in the United States; by Henry Gannett. pp. 325. 8°. Wash., Govt., 1884. (Bulletin 5.)

— — — — Ed. 2, [rev.]. pp. 393. 8°. Wash., Govt., 1891. (Bulletin 76.)

— — — — Ed. 3, [rev.]. pp. 775. 8°. Wash., Govt., 1899. (Bulletin 160.)

— — — — (*U. S.—House of Representatives.* 55th Cong. 3d sess. H. doc. 305. *In* v. 88.) W^A

1507 —— Effect upon certain rivers in Colorado of the diversion of water for irrigation; [report]. pp. 7. 8°. [Wash., Govt., 1889.] (*U. S.—Senate.* 50th Cong. 2d sess. S. ex. doc. 120. *In* v. 3.) W^A

1508 —— Engineering results of irrigation survey; by H. M. Wilson. (*In* 13th Annual report, 1891-92. pt. 3. pp. 351-427. pl. maps. 1893.) W^A

— — — —; [separate]. 4°.

1509 —— Estimates of necessary expenses of irrigation branch of the Survey for the fiscal year ending June 30, 1891, also calling attention to the report of the director, made last December. pp. 3. 8°. [Wash., Govt., 1890.] (*U. S.—House of Representatives.* 51st Cong. 1st sess. H. ex. doc. 326. *In* v. 35.) W^A

— — — —; additional estimate. pp. 3. 8°. [Wash., Govt., 1890.] (*U. S.—House of Representatives.* 51st Cong. 1st sess. H. ex. doc. 330. *In* v. 35.) W^A

United States—Interior, Department of the—Geological survey—
Continued.

1510 — — — Gauging the streams and determining the water supply of the United States; letter from acting Secretary of the Treasury, transmitting estimate of appropriation for continuing work. pp. 3. 8°. [Wash., Govt., 1896.] (U. S.—*House of Representatives*. 54th Cong. 1st sess. H. doc. 257. *In v. 58.*) W^A

1511 — — — Geological reconnaissance in central Washington; by I. C. Russell. pp. 108. il. pl. maps. 8°. Wash., Govt., 1893. (Bulletin 108.) W^A
Investigation of Yakima river basin and vicinity with special reference to artesian resources.

1512 — — — Geological reconnaissance of northwestern Wyoming; by G. H. Eldridge. pp. 72. pl. map. 8°. Wash., Govt., 1894. (Bulletin 119.) W^A

1513 — — — Geology of Denver basin in Colorado; by Samuel Franklin Emmons, Whitman Cross, and George Homans Eldridge. pp. 556. il. pl. 4°. Wash., Govt., 1896. (Monographs. v. 27.) W^A
Contains description of artesian wells and structural conditions in vicinity of Denver.

1514 — — — Geology of Edwards plateau and Rio Grande plain adjacent to Austin and San Antonio, Texas, with reference to occurrence of underground waters; by Robert T. Hill and T. Wayland Vaughan. (*In* 18th Annual report, 1896/97. pt. 2. pp. 193–321. il. pl. maps. 1898.) W^A
— — — — —; [separate]. 4°.

1515 — — — Glacial Lake Agassiz; by Warren Upham. pp. 658. pl. maps. 4°. Wash., Govt., 1895. (Monographs. v. 25.) W^A
Chapter 10. Artesian and common wells of the Red river valley.—Chap. 11. Agricultural and material resources of the area of Lake Agassiz.

1516 — — — Hydrography of the arid regions; by F. H. Newell. (*In* 12th Annual report, 1890/91. pt. 2. pp. 213–361. il. pl. charts. 1891.) W^A

1517 — — — Irrigation in India; by H. M. Wilson. (*In* 12th Annual report, 1890/91. pt. 2. pp. 363–561. il. pl. 1891.) W^A
— — — — —; [separate]. 4°. W^G

1518 — — — Irrigation survey; . . . estimate of appropriation for the survey of arid lands. pp. 2. 8°. [Wash., Govt., 1889.] (U. S.—*House of Representatives*. 50th Cong. 2d sess. H. ex. doc. 54. *In v. 25.*) W^G W^A

1519 — — — Irrigation upon Pima Indian reservation, Ariz.; report. pp. 5. 8°. [Wash., Govt., 1900.] (U. S.—*Senate*. 56th Cong. 1st sess. S. doc. 304. *In v. 26.*) W^A

1520 — — — Letter from the director of the Geological survey relative to gauging the streams and determining the water supply of the United States, including the investigation of underground currents and artesian wells in arid and semiarid sections. pp. 11. 8°. [Wash., Govt., 1896.] (U. S.—*Senate*. 54th Cong. 1st sess. S. doc. 187. *In v. 7.*) W^A

United States—Interior, Department of the—Geological survey—Continued.

1521 — — — New developments in well boring and irrigation in eastern South Dakota, 1896; by Nelson Horatio Darton. (*In* 18th Annual report, 1896 97. pt. 4. pp. 561-615. il. pl. maps. 1897.) W^A
 — — — —; [separate]. 4°.

1522 — — — Preliminary report on the artesian waters of a portion of the Dakotas; by Nelson Horatio Darton. (*In* 17th Annual report, 1895 96. pt. 2. pp. 603-694. il. pl. maps. 1896.) W^A
 — — — — pp. 92. il. pl. maps. 4°. Wash., Govt., 1896.

1523 — — — Preliminary report on the geology and water resources of Nebraska west of 103d meridian; by Nelson Horatio Darton. (*In* 19th Annual report, 1897 98. pt. 4. pp. 719-785. pl. maps. 1899.) W^A
 — — — —; [separate]. 4°.

1524 — — — [Preliminary report on the organization and prosecution of the survey of the arid lands for purposes of irrigation.] pp. 12. 8°. [Wash., Govt., 1889.] (*U. S.—Senate.* 50th Cong. 2d sess. S. ex. doc. 43. *In* v. 1.) W^A

1525 — — — Principles and conditions of movements of ground water; by Franklin Hiram King. (*In* 19th Annual report, 1897-98. pt. 2. pp. 59-294. il. pl. 1899.) W^A
 — — — —; [separate with], Theoretical investigation of motion of ground waters; by Charles Sumner Slichter. pp. 59-384. il. pl. 4°. Wash., Govt., 1899.

1526 — — — Public lands and their water supply; by F. H. Newell. (*In* 16th Annual report, 1894 1895. pt. 2. pp. 457-533. il. pl. maps, 1 in pocket. 1895.) W^A
 — — — —; [separate]. 4°.

1527 — — — Report, in response to Senate resolution of Feb. 13, 1888, concerning the irrigation of certain lands. pp. 6. 8°. [Wash., Govt., 1888.] (*U. S.—Senate.* 50th Cong. 1st sess. S. ex. doc. 134. *In* v. 10.) W^A W^G
 In reply to Senate resolution requesting the opinion of the Secretary of the Interior as to the desirability of authorizing the Geological survey to segregate lands of the public domain, capable of irrigation in the sections of the United States where irrigation is required, from other lands, and to lay out suitable places to be reserved for reservoirs, and rights of way for ditches and canals, for the purposes of irrigation.

1528 — — — Report in response to Senate resolution of March 27, 1888, relative to the reservoirs for storage of water in the arid regions of the United States. pp. 6. 8°. [Wash., Govt., 1888.] (*U. S.—Senate.* 50th Cong. 1st sess. S. ex. doc. 163. *In* v. [10].) W^G W^A

1529 — — — Report on lands of the arid region of the United States, with a more detailed account of the lands of Utah; by J. W. Powell. pp. 195. maps in pocket. 4°. Wash., Govt., 1878. (*U. S.—House of Representatives.* 45th Cong. 2d sess. H. ex. doc. 73. *In* v. 13.) W^A

CONTENTS—Physical characteristics of arid region.—Land-system needed.—Rainfall—Water supply, by G. K. Gilbert.—Certain important questions relating to irrigable lands—Lands of Utah—Irrigable lands of Salt Lake drainage system, by G. K. Gilbert—Irrigable lands of the valley of Sevier river, by C. E. Dutton.—Irrigable lands of Utah drained by Colorado river and its tributaries, by A. H. Thompson.—Land grants in aid of internal improvements by Willis Drummond, Jr.

United States—Interior, Department of the—Geological survey—
Continued.

*— — — — — Ed. 2. Wash., 1879.

1530 — — — — Report relative to the use made of the appropriations for the irrigation survey. pp. 8. 8°. [Wash., Govt., 1890.] (U. S.—Senate. 51st Cong. 1st sess. S. ex. doc. 141. *In v. 11.*) W^A

1531 — — — — Report upon the construction of topographic maps and selection and survey of reservoir sites in hydrographic basin of Arkansas river in Colorado; by A. H. Thompson. (*In* 13th Annual report, 1891 92. pt. 3. pp. 429—444. il. pl. 1893.) W^A

1532 — — — — Report upon the location and survey of reservoir sites, during fiscal year ended June 30, 1891; by A. H. Thompson. (*In* 12th Annual report, 1890 91. pt. 2. pp. 1—212. il. pl. 1891.) W^A
— — — — —, during fiscal year ending June 30, 1892; by A. H. Thompson. (*In* 13th Annual report, 1891/92. pt. 3. pp. 445—478. 1893.) W^A

1533 — — — — Reports of the director of the Geological survey and commissioner of the General land office relative to the selection of sites for reservoirs. pp. 8. 8°. [Wash., Govt., 1890.] (U. S.—Senate. 51st Cong. 1st sess. S. ex. doc. 199. *In v. 11.*) W^A

1534 — — — — Reports on the investigations and survey for an international dam and reservoir on the Rio Grande del Norte, to preserve boundary between United States and Mexico by controlling flood waters of said river; by Anson Mills and W. W. Follett. pp. 86. map. charts. 8°. Wash., Govt., 1896.
Appended are congressional reports, hearings, etc., bearing on this subject.

1535 — — — — Reports upon irrigation and reclamation of lands; in response to Senate resolution, April 20, 1892. pp. 73. 8°. [Wash., Govt., 1892.] (U. S.—Senate. 52d Cong. 1st sess. S. ex. doc. 100. *In v. 6.*) W^A
Contains reports from Census office and Geological survey in regard to the publications of these offices relative to irrigation matters and the expenses thereby entailed, with list of persons employed, etc.

1536 — — — — Requisite and qualifying conditions of artesian wells; by Thomas C. Chamberlin. (*In* U. S.—Interior, Dept. of the—Geological survey. 5th Annual report, 1883 84. pp. 125—173. 1885.) W^A
— — — — —; [separate]. 4°.

1537 — — — — Reservoirs for irrigation; by James D. Schuyler. (*In* 18th Annual report, 1896 97. pt. 4. pp. 617—740. il. pl. maps. 1897.) W^A
— — — — —; [separate]. 4°.

1538 — — — — Results of stream measurements; by F. H. Newell. (*In* 14th Annual report, 1892 93. pt. 2. pp. 89—155. il. pl. 1894.) W^A

United States—Interior, Department of the—Geological survey—Continued.

— — — — : [separate]. 4°. 1895.
 This report is the fifth of a series, preceding papers of which are: Hydrographic work. 10th Annual report, pt. 2. pp. 78-90.—Hydrography. 11th Annual report, pt. 2. pp. 1-110.—Hydrography of arid regions. 12th Annual report, pt. 2. pp. 213-361.—Water-supply for irrigation. 13th Annual report, pt. 3. pp. 1-99.

1539 — — — — Statement of Chas. D. Walcott, [before Committee on public lands]. (*In U. S.—House of Representatives—Public lands, Committee on. Hearings relating to reclamation and disposal of arid public lands of the West.* pp. 34-40. pl. 1901.)

1540 — — — — Statements by Director Powell and other officers of U. S. Geological survey. (*In U. S.—Senate—Irrigation and reclamation of arid lands, Select committee on. Report.* pt. 5. pp. 5-224. 1890.)

1541 — — — — Statements of J. W. Powell and other officers of the U. S. Geological survey before House select committee on irrigation of arid lands. (*In U. S.—House of Representatives—Irrigation of arid lands in the United States, Select committee on. Ceding arid lands to states and territories.* 1891.)

1542 — — — — Surveys of reservoir sites; report [by F. H. Newell. pp. 20. 8°. [*Wash., Govt., 1899.*] (*U. S.—Senate. 55th Cong. 3d sess. S. doc. 116. In v. 11.*) W^A

1543 — — — — Theoretical investigation of motion of ground waters; by Charles Sumner Slichter. (*In 19th Annual report, 1897-98.* pt. 2. pp. 295-384. il. pl. 1899.) W^A
 Contains bibliography.
 — — — — — (*In King, Franklin Hiram. Principles and conditions of movements of ground water.* pp. 295-384. il. pl. 1899.)

1544 — — — — Underground water of Arkansas valley in eastern Colorado; by Grove Karl Gilbert. (*In 17th Annual report, 1895/96.* pt. 2. pp. 551-601. il. pl. 1896.) W^A
 — — — — —; [separate]. 4°.
 — — — — — pp. 51. il. pl. 4°. *Wash., Govt., 1896.*

1545 — — — — Water resources of a portion of the Great plains; by Robert Hay. (*In 16th Annual report, 1894/1895.* pt. 2. pp. 535-588. il. pl. maps. 1895.) W^A
 — — — — —; [separate]. 4°.

1546 — — — — Water resources of Illinois; by Frank Leverett. (*In 17th Annual report, 1895/96.* pt. 2. pp. 695-849. il. pl. maps. 1896.) W^A
 — — — — — pp. 155. il. pl. maps. 4°. *Wash., Govt., 1896.*

1547 — — — — Water resources of the United States; communication relative to investigations being made, particularly of the arid regions. pp. 7. 8°. [*Wash., Govt., 1900.*] (*U. S.—Senate. 56th Cong. 1st sess. S. doc. 338. In v. 33.*) W^A

United States—Interior, Department of the—Geological survey—
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1548 ——— Water supply for irrigation; by F. H. Newell. (*In* 13th Annual report, 1891/92. pt. 3. pp. 1-99. il. pl. 1893.) W^A

1549 ——— *Hydrography, Division of.* Abstract of petitions, memorials, requests, and estimates relating to operations of office. pp. 71. 8°. Wash., Govt., 1901. (*U. S.—Senate.* 56th Cong. 2d sess. S. doc. 152. *In* v. 11.) W^A

1550 ——— Circular 1-7. 8°. [Wash., Govt., 1896-1899.]

CONTENTS—Circular 1; Instructions for rain-fall observers of U. S. Geological survey. pp. 4. il. 1889.—Circular 2; Instructions for observing air temperature, humidity, and direction and force of wind. pp. 7. il. [1896?].—Circular 3; Vapor pressure, dew-point, and relative humidity tables adapted to whirled, or sling, psychrometer. pp. [4]. ob. 8°. n. d.—Circular 4; Instructions for measuring rate of evaporation from water surfaces. pp. 4. n. d.—Circular 5; Hydrographic survey [with bibliography of Survey publications relating to water supply]. pp. 10. [1896].—Circular 6; Annual reports, [information concerning,] and work of the Division. pp. 4. 1898.—Circular 7; Reservoir surveys. pp. 4. 1899.

1551 ——— Conditions and cost of water storage for irrigation on Gila river, Arizona; report of James D. Schuyler, for benefit of Indians occupying Gila river reservation. pp. 17. 8°. [Wash., Govt., 1899.] (*U. S.—Senate.* 56th Cong. 1st sess. S. doc. 37. *In* v. 4.) W^A

——— [Ed. 2, rev.] pp. 19. 8°. [Wash., Govt., 1900.] (*U. S.—Senate.* 56th Cong. 1st sess. S. doc. 152. *In* v. 10.) W^A

1552 ——— Hydrographic surveys. pp. 10. 8°. [Wash., Govt., 1896.] (Circular 5.)

Reports the progress and character of work of the Irrigation survey and of related investigations being carried on by the Division of hydrography. Also gives review of the legislation authorizing this work, with a list of publications of the Geological survey, showing results accomplished.

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1586 — *Foreign relations, Committee on.* Equitable distribution of waters of Rio Grande [between United States and Mexico]; report to accompany S. 3794. pp. 8. 8°. [Wash., Govt., 1900.] (56th Cong. 2d sess. S. rp. 1755. *In v. 2.*)
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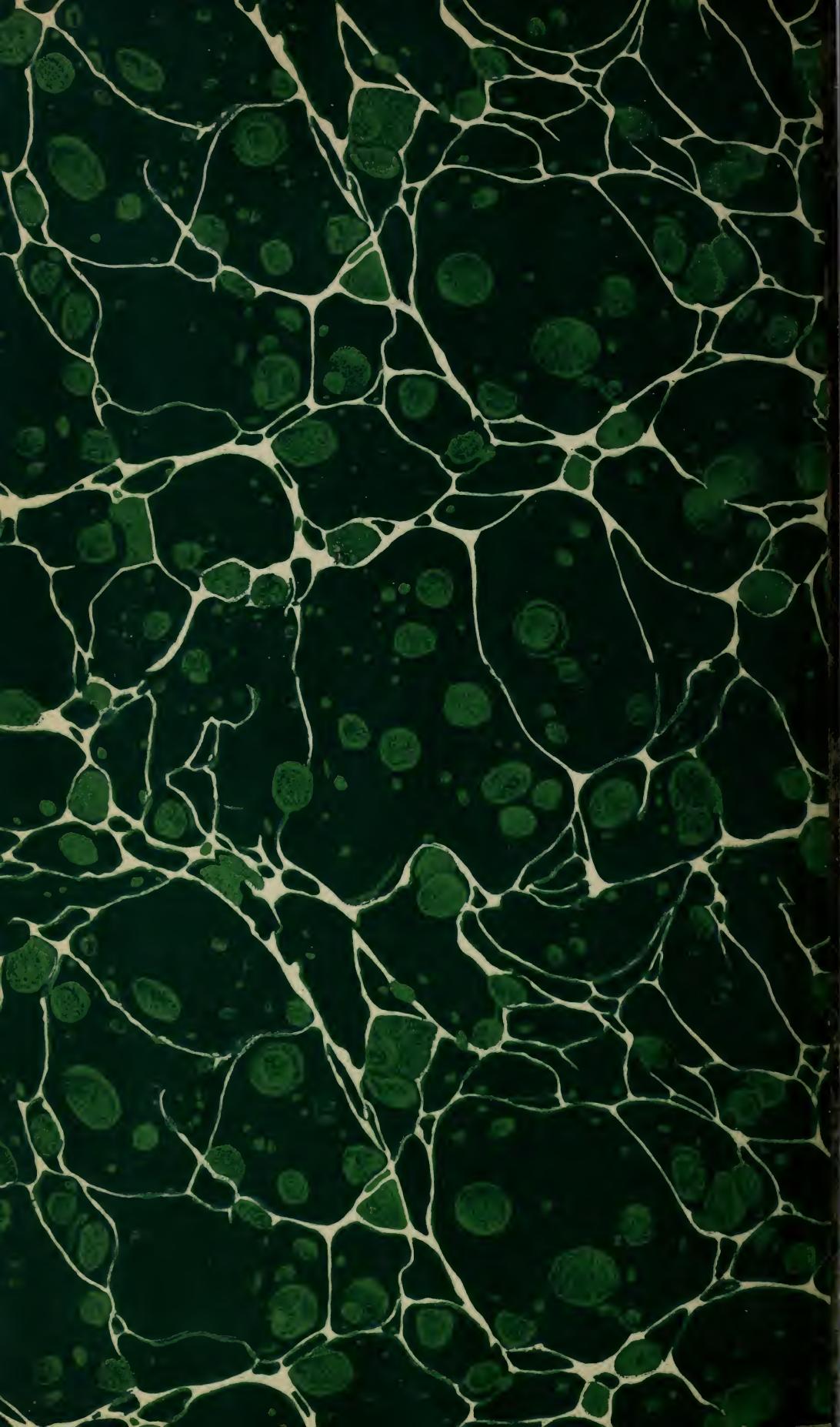
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